Amendments to the Claims

Please cancel claims 4 and 5, and amend claims 1 and 17 as shown in the following list of claims. This listing of claims will replace all prior versions, and listings, of claims in the application.

1. (currently amended) An optical device comprising:

an optics system comprising an input to receive optical signals in an incoming direction and an output to selectively transmit a selected optical signal of said optical signals in an outgoing direction, said optics system being configured to selectively rotate one of the polarization components of each of said optical signals in said incoming direction to a first polarization state;

an optical unit optically coupled to said optics system, said optical unit being configured to laterally displace and rotate said polarization components of said selected optical signal such that said polarization components of said selected optical signal in said outgoing direction are in said first polarization state, said optical unit comprising one of a Wollaston prism and a polarizing beamsplitter, and a wave plate positioned such that said polarization components of said selected optical signal in said outgoing direction are selectively transmitted through said wave plate; and

a diffraction grating positioned between said optics system and said optical unit to diffract said polarization components of said selected optical signal in said incoming and outgoing directions, said polarization components of said selected optical signal being in said first polarization state in both said incoming and outgoing directions at said diffraction grating.

2. (original) The optical device of claim 1, wherein said diffraction grating has a grating line frequency greater than 900 grating lines per mm.

3. (original) The optical device of claim 1, wherein said optical unit comprises a walk-off crystal and a wave plate positioned such that said polarization components of said selected optical signal in said outgoing direction are selectively transmitted through said wave plate.

4. (canceled).

5. (canceled).

6. (original) The optical device of claim 1, further comprising a controllable switching array, said controllable switching array including pixels with changeable optical property.

7. (original) The optical device of claim 6, wherein said pixels include electrically controllable birefringent material.

8. (original) The optical device of claim 7, wherein said electrically controllable birefringent material is one of liquid crystal and lithium niobate.

9. (original) An optical device comprising:

an input optical unit comprising an input to receive optical signals, said input optical unit being configured to selectively rotate one of the polarization components of each of said optical signals to a first polarization state;

an output optical unit comprising an output to selectively transmit said polarization components of a selected optical signal of said optical signals;

a diffraction grating optically coupled to said input and output optical units to diffract said polarization components of said optical signals to and from said input and output optical units;

an active optical element optically coupled to said diffraction grating, said active optical element being configurable to selectively convert said polarization components of said selected optical signal from said first polarization state to a second polarization state; and

an intermediate optical unit positioned between said diffracting grating and said active optical element, said intermediate optical unit being configured to laterally displace and rotate said polarization components of said selected optical signal in an outgoing direction from said second polarization state to said first polarization state such that said polarization components of said selected optical signal are in said first polarization state at said diffraction grating in both said incoming and outgoing directions.

10. (original) The optical device of claim 9, wherein said diffraction grating has a grating line frequency greater than 900 grating lines per mm.

11. (original) The optical device of claim 9, wherein said intermediate optical unit comprises a walk-off crystal and a wave plate positioned such that said polarization components of said selected optical signal in said outgoing direction are selectively transmitted through said wave plate.

12. (original) The optical device of claim 9, wherein said intermediate optical unit comprises a Wollaston prism and a wave plate positioned such that said polarization components of said selected optical signal in said outgoing direction are selectively transmitted through said wave plate.

13. (original) The optical device of claim 9, wherein said intermediate optical unit comprises a polarizing beamsplitter and a wave plate positioned such that said polarization components of said selected optical signal in said outgoing direction are selectively transmitted through said wave plate.

14. (original) The optical device of claim 9, wherein said active optical element comprises a controllable switching array, said controllable switching array including pixels with changeable optical property.

15. (original) The optical device of claim 14, wherein said pixels comprises electrically controllable birefringent material.

16. (original) The optical device of claim 15, wherein said electrically controllable birefringent material is one of liquid crystal and lithium niobate.

17. (currently amended) A method for transmitting a selected optical signal, said method comprising:

receiving optical signals at an input optical unit of an optical device;

selectively rotating polarization components of said optical signals to a first polarization state at said input optical unit;

diffracting said polarization components of said optical signals in said first polarization state using a diffraction grating of said optical device to spatially separate said polarization components;

selectively converting said polarization components of a selected optical signal of said optical signals from said first polarization state to a second polarization state using an active optical element of said optical device;

laterally displacing said polarization components of the selected optical signal at an intermediate optical unit of said optical device, said intermediate optical unit being positioned between said diffraction grating and said active optical element;

rotating said polarization components of said selected optical signal from said second polarization state back to said first polarization state at said intermediate optical unit;

diffracting said polarization components of said selected optical signal in said first polarization state using said diffraction grating; and

outputting said polarization components of said selected optical signal at an output optical unit of said optical device.

18. (original) The method of claim 17, wherein said converting includes reflecting said polarization components of said optical signals.

19. (original) The method of claim 17, wherein said converting includes converting said polarization components of said selected optical signal from said first polarization state to said second polarization state in response to an electrical control signal.

20. (original) The method of claim 17, wherein said laterally displacing includes transmitting said polarization components of said selected optical signal through a device that only laterally displaces said polarization components in said second polarization state.